

## CLAIMS

1. A laser processing apparatus for processing a member to be processed by irradiating the member with laser light, the apparatus comprising:

- 5 a laser for generating laser light;  
optical means for converging the laser light generated by the laser onto a processing area; and  
a filter, disposed between the member to be processed and the optical means, for blocking a  
10 wavelength of fluorescence generated by the optical means upon pumping with the laser light;  
wherein light having the wavelength blocked by the filter is used for measuring a temperature of the processing area.

15 2. A laser processing apparatus for processing a member to be processed by irradiating the member with laser light, the apparatus comprising:

- a laser for generating laser light;  
first optical means for converging the laser  
20 light generated by the laser onto a processing area;  
and  
second optical means, disposed between the member to be processed and the first optical means, for blocking a wavelength of fluorescence generated by the  
25 optical means upon pumping with the laser light;

wherein light having the wavelength blocked by

the second optical means is used for measuring a temperature of the processing area.

3. A laser processing apparatus according to claim 1 or 2, wherein the filter or second optical means blocks a wavelength other than an oscillation wavelength of the laser light.

4. A laser processing temperature measuring apparatus for measuring the temperature of the processing area being processed by the laser processing apparatus according to claim 1 or 2,

the measuring apparatus comprising temperature detecting means for detecting the temperature according to a light component having the wavelength blocked by the filter or second optical means in light thermally radiating from the processing area.

5. A laser processing method for processing a member to be processed by irradiating the member with laser light; the method comprising:

a laser light generating step of generating laser light;

a light-converging step of causing an optical system to converge the laser light generated by the laser light generating step onto a processing area; and

a fluorescence blocking step of causing a filter to block a wavelength of fluorescence generated by the optical system upon pumping with the laser light before

processing;

wherein light having the wavelength blocked by the fluorescence blocking step is used for measuring a temperature of the processing area.

5           6.    A laser processing method for processing a member to be processed by irradiating the member with laser light; the method comprising:

          a laser light generating step of generating laser light;

10           a light-converging step of causing a first optical system to converge the laser light generated by the laser light generating step onto a processing area; and

          a fluorescence blocking step of causing a second  
15           optical system to block a wavelength of fluorescence generated by the first optical system upon pumping with the laser light before processing;

          wherein light having the wavelength blocked by the fluorescence blocking step is used for measuring a  
20           temperature of the processing area.

          7.    A laser processing temperature measuring method for measuring the temperature of the processing area being processed by the laser processing method according to claim 5 or 6, the measuring method  
25           comprising:

          a temperature detecting step of detecting the

temperature according to a light component having the wavelength blocked by the fluorescence blocking step in light thermally radiating from the processing area.

8. A laser processing apparatus for welding  
5 resin members to each other by using laser light, the apparatus comprising:

a semiconductor laser for generating laser light;  
and

10 a filter, disposed between the semiconductor laser and the resin members, for blocking light having a wavelength to become an observation wavelength for measuring a temperature of a welding area in the light generated by the semiconductor laser;

15 wherein light having the wavelength blocked by the filter is used for measuring the temperature of the welding area.

9. A laser processing apparatus for welding resin members to each other by using laser light, the apparatus comprising:

20 a semiconductor laser for generating laser light;  
and

25 optical means for converging the laser light generated by the semiconductor laser onto a welding area and blocking light having a wavelength to become an observation wavelength for measuring a temperature of the welding area in the light generated by the

semiconductor laser;

wherein light having the wavelength blocked by the optical means is used for measuring the temperature of the welding area.

5           10. A laser processing apparatus according to claim 8 or 9, wherein the filter or optical means blocks light having a wavelength other than an oscillation wavelength of the semiconductor laser.

10           11. A laser processing apparatus according to claim 8 or 9, wherein the filter or optical means blocks light having a wavelength falling within the range of 1100 nm to 2800 nm.

15           12. A laser processing temperature measuring apparatus for measuring the temperature of the welding area being welded by the laser processing apparatus according to claim 8 or 9, the measuring apparatus comprising:

20           temperature detecting means for detecting the temperature according to a light component having the wavelength blocked by the filter or optical means in light thermally radiating from the welding area.

13. A laser processing method for welding resin members to each other by using laser light, the method comprising:

25           a laser light generating step of causing a semiconductor laser to generate laser light; and

a filtering step of blocking light having a wavelength to become an observation wavelength for measuring a temperature of a welding area in the light generated by the laser light generating step with a  
5 filter before welding;

wherein light having the wavelength blocked by the filtering step is used for measuring the temperature of the welding area.

14. A laser processing method for welding resin  
10 members to each other by using laser light, the method comprising:

a laser light generating step of causing a semiconductor laser to generate laser light; and

a filtering step of blocking light having a  
15 wavelength to become an observation wavelength for measuring a temperature of a welding area in the light generated by the laser light generating step with an optical system adapted to converge the laser light generated by the laser light generating step onto the  
20 welding area;

wherein light having the wavelength blocked by the filtering step is used for measuring the temperature of the welding area.

15. A laser processing temperature measuring  
25 method for measuring the temperature of the welding area being welded by the laser processing method

according to claim 13 or 14, the measuring method comprising:

5 a temperature detecting step of detecting the temperature according to a light component having the wavelength blocked by the filtering step in light thermally radiating from the welding area.